

Application No. 09/605,085  
Response to Office Action of July 30, 2003

### REMARKS

In the Office Action of July 30, 2003, claims 1-20 stand rejected. Claims 1-3, 6-7, 13 and 20 have been amended. Reconsideration and allowance of all pending claims are respectfully requested in view of the following remarks. No new subject matter is being added by this response.

#### I. CLAIM REJECTIONS.

##### A. 35 U.S.C. § 103 Rejections.

Claims 1-14 and 16-20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,104,926 issued to Hogg (hereinafter "*Hogg*") in view of U.S. Patent No. 5,557,656 to Ray (hereinafter "*Ray*") or Slides from an ARCSS presentation (hereinafter "*ARCSS*") or PCT Publication No. WO9602094 to Gilhousen (hereinafter "*Gilhousen*") and U.S. Patent No. 6,601,562 to Martin et al. (hereinafter "*Martin*"), U.S. Patent No. 6,275,187 to Ross (hereinafter "*Ross*"), EP Patent EPO803742 to Upton (hereinafter "*Upton*"), U.S. Patent No. 6,061,561 to Alanara et al. (hereinafter "*Alanara*") and U.S. Patent No. 5,509,051 to Barnett et al. (hereinafter "*Barnett*"). Specifically, the Examiner argues that *Hogg* (or *Ray*, *ARCSS* or *Gilhousen*) teaches a method of maintaining a terrestrial cell site handoff list for airborne cellular systems. The Examiner further argues that *Martin* teaches maintaining a fixed beam pattern of beams transmitted from an airplane and determining the locations of cell sites within the respective beams. The Examiner further argues that *Martin*, *Ross*, *Upton* and *Alanara* all disclose obtaining location/heading/position of a mobile user. The Examiner argues that *Ross* teaches directing beams transmitted from the airplane based on the airplane flight pattern data. The Examiner further argues that *Barnett* teaches calculating a list of viable handoff terrestrial cell candidates based on maintaining of a fixed beam pattern the determination of location and heading of the user/airplane, the determination of locations of respective beams transmitted and the determination of locations of respective cell sites.

To establish a prima facie case of obviousness under 35 U.S.C. § 103, three requirements must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation

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of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. M.P.E.P. 2143. Since the Examiner has not established a prima facie case of obviousness the Applicant respectfully traverses this rejection.

The majority of the prior art cited by the Examiner are drawn to two distinct technologies. The first technology is that of aerial communication, most notably technology to facilitate the use of a phone on an airplane. In this technology, the user on the airplane is a mobile user. As the airplane travels from one point to another the calls are handed off to different land based systems. *Hogg*, *Ray* and *Gilhousen* all disclose systems where the mobile users are on an aircraft.

Another technology covered by some of the cited art is the use of an aircraft to provide cellular/wireless communications. In these systems an aircraft flies a set pattern around an area. The aircraft receives cellular/wireless communications from land based mobile units and directs the communications to another land based mobile unit or the telephone equipment. The aircraft, in this manner, acts much like a ground based base station except the aircraft can cover a larger area. *Martin* and *ARCSS* discuss such an arrangement.

These two technologies are so different in design and implementation that they are not combinable as suggested by the Examiner. For example, the primary reference *Hogg* discloses a way to provide a handoff for an onboard phone system as the aircraft crosses over the coverage area of one radio base station to another radio base station as the plane travels along its route. Nowhere in *Hogg* is there teaching or a suggestion to add the teaching of *Martin* regarding maintaining a fixed pattern of beams transmitted to cellular users or determining cell sites within the footprint of the beam, as the Examiner alleges is taught by *Martin*. This is because *Hogg* does not need multiple beams because *Hogg* does not need to cover an area or areas to support communication between cellular users. Because there is no teaching or suggestion in *Hogg* to make any of the combinations by the Examiner, especially the combination of *Hogg* and *Martin*, the proposed combination can not be made and any rejection that relies on such a combination should be withdrawn, which, is all pending claims 1-20.

Even assuming that the proposed combination could be made, the proposed combination fails to teach or suggest all the limitations of the claims of the present invention. Considering claim 1, claim 1, as amended, discloses, in part "a list of viable handoff terrestrial cell site candidates for handoffs between one or more beams and terrestrial cell sites". This limitation is

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not found in *Hogg* or any other of the references cited. The Examiner claims that *Hogg* discloses a method of maintaining a terrestrial cell list. However, in *Hogg* the handoff is of a mobile call made on a plane from one terrestrial ground station to another terrestrial ground station. Such a system is not the same as handoffs between beams from an aircraft and terrestrial ground stations. The Examiner further argues that the limitation of maintaining a terrestrial cell site handoff list can be found in the abstract of *Ray* or *Gilhousen* or in the *ARCSS* slide presentation. The abstract of *Ray*, similar to the disclosure of *Hogg*, discusses handoffs between terrestrial cells only and never discusses the formation of a handoff list as disclosed in the present invention. In the abstract of *Gilhousen* there is no mention of either handoffs or a list of handoff candidates. And the *ARCSS* slides show generally an airborne communication system but do not show the calculating of a list of handoff candidates.

Additionally, the proposed combination fails to disclose, teach or suggest "determining locations of each of the one or more beams transmitted from the airplanes based on airplane flight pattern data." The Examiner argues that this limitation is disclosed in the abstract of *Ross* as well as in FIG. 1 of *Ross*. However, the abstract and FIG. 1 of *Ross* discloses a system for directing the lobe of an antenna from a ground based antenna towards an airplane. *Ross* does not disclose, teach or suggest determining the location of beams "transmitted from the airplane" (emphasis added) as in claim 1, because in *Ross* beams are not transmitted from the airplane.

The proposed combination also fails to disclose, teach or suggest "calculating a list of viable handoff terrestrial cell site candidates for handoffs between one or more beams and terrestrial cell sites based on maintaining a fixed beam pattern, the location and heading of the airplane, the locations of respective beams transmitted from the airplane based on airplane flight pattern data, and the locations of respective cell sites." as in claim 1. The Examiner points to *Barnett* as disclosing this limitation. However, *Barnett* discloses a method for prioritizing handoffs between terrestrial based cells using the measured RF signal strength of the mobile user. At the very least *Barnett* does not disclose calculating a list "for handoffs between one or more beams and terrestrial cell sites", as *Barnett* discloses terrestrial to terrestrial based handoffs. Also, *Barnett* fails to disclose that the calculating of the list is based on "the location of respective beams transmitted from the airplane based on airplane flight data". *Barnett* uses the RF signal strength of a mobile user and not the location of beams transmitted from the airplane. The Examiner argues that the mobile users in *Barnett*, when read broadly, reads on an airplane.

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This might be relevant if the present invention involved mobile phone calls made on a plane. However, in the present invention, the airplane is used to support terrestrial based mobile users and the handoff is of a terrestrial mobile user from the airborne system to a local terrestrial base station.

For all the above reasons, claim 1 is in condition for allowance. Claims 2-12 depend from claim 1. Therefore, for at least these reasons claims 2-12 are in condition for allowance.

Considering claim 3, the Examiner argues that *Barnett* teaches a handoff list and *Ross* teaches directing an aircraft antenna array as it moves. However, as discussed above, at the very least *Barnett* does not teach or disclose "mapping data generated in the determining of location of one or more beams transmitted from the airplane based on airplane flight data" as in claim 3. The addition of *Ross* does not solve the shortcomings of *Barnett*. Indeed, as discussed previously, *Ross* discloses directing an aircraft antenna from the ground to an aircraft, and not one or more beams transmitted by the airplane. For at least these reasons, claim 3 is allowable.

Considering claim 4, the Examiner argues that *Barnett* discloses "rendering each of the viable handoff terrestrial cell site candidates based on associated probability data". However, *Barnett* prioritizes based on adjusted RF signal strength (column 7, lines 32-35), which is not a probability calculation. For at least this reason claim 4 is allowable.

Considering claim 6, the Examiner argues that *Hogg* discloses calculating a list of cell sites for each of the respective beams transmitted from the airplane. However, *Hogg*, as discussed earlier, discloses handing off an airborne conversation from one terrestrial site to another terrestrial site. Therefore, there is no "the calculating of a list of viable handoff terrestrial cell site candidates for handoffs between one or more beams and terrestrial cell sites is performed for each of the one or more beams transmitted from the airplane" (emphasis added). For at least this reason, claim 6 is in condition for allowance.

Considering claim 12, the Examiner argues that *Martin* discloses "dividing the list ... into time sensitive and non-time sensitive handoff candidates". However, the *Martin* specification merely states the airborne system can accommodate broad band and narrow band communication. There is no discussion in *Martin* that one of the listed tasks is more time critical than another. Nor is there any mention of dividing a list of handoff candidates based on time sensitivity. Therefore, the proposed combination fails to disclose, teach or suggest all the

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limitations of claim 12. Therefore, for at least these reasons, claim 12 is in condition for allowance.

Considering independent claim 13, claim 13 is allowable for the same reasons as claim 1. For example, the proposed combination fails to disclose, teach or suggest "calls to be handed off from the communications beams transmitted from the airplane to terrestrial cell sites." For at least this reason, claim 13 is allowable.

Claims 14 and 16-20 depend from allowable independent claim 13. For at least this reason, claims 14 and 16-20 are allowable.

Considering claim 14, claim 14 recites, in part "wherein the flight pattern information comprises airplane location, heading, and beam footprint information". The Examiner argues that this limitation can be found in *Ross*, *Martin*, *Upton* and *Alanara* in conjunction with *Hogg*. However, *Ross* discloses directing a lobe of an antenna to an aircraft and is thus not "beam footprint information". *Martin* may show antenna footprints in FIG. 2, but does not disclose flight information comprising airplane location, heading and beam footprint information. The Examiner further argues that *Martin*, *Ross*, *Upton* and *Alanara* all disclose the location/heading/position of a "mobile user" which is equivalent to the flight information of claim 14. However, as the Examiner points out, and as has been discussed previously, these references disclose the movement of a "mobile user" and not an aircraft that is an airborne repeater. Therefore, the rejection to claim 14 should be withdrawn.

Claim 15 stands rejected under 35 U.S.C. 103(a) as unpatentable over *Hogg/Martin* and further in view of European Patent No. EP0837567 to Ayyagari (hereinafter "*Ayyagari*") and presumably *Barnett* as well. Specifically, the Examiner argues the *Hogg/Martin* combination discloses all of claim 15 except for the use of a database and processor implemented in ground-based base stations. The Examiner argues that *Barnett* teaches ground based communication systems and *Ayyagari* teaches ground-based communication systems for airborne broadband communication networks.

The argument regarding the *Hogg/Martin* combination is illegitimate because *Hogg* does not teach or suggest the addition of *Martin* applies for this claim as well. Therefore, for at least this reason, the rejection of claim 15 should be withdrawn.

Additionally, claim 15 depends from allowable claim 13. Therefore, claim 15 is in condition for allowance.

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## II. CONCLUSION


For the foregoing reasons, the present application is believed to be in condition for allowance and favorable action is respectfully requested. The Examiner is invited to telephone the undersigned at the telephone number listed below if it would in any way advance prosecution of this case.

The Applicant hereby petitions for a two-month extension of time, to be paid for from Deposit Account Number 50-2091. While no other fees are believed due, the applicant hereby requests that any other required fee to maintain pendency of this case, except for the Issue Fee, be charged to Deposit Account 50-2091.

Respectfully submitted,

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Date

By

  
Alexander B. Ching  
Reg. 41,669

Ingrassia, Fisher and Lorenz P.C.  
7150 East Camelback Road, Suite 325  
Scottsdale, Arizona 85251  
Telephone: (480) 385-5060  
Fax: (480) 385-5061  
Customer No. 29906